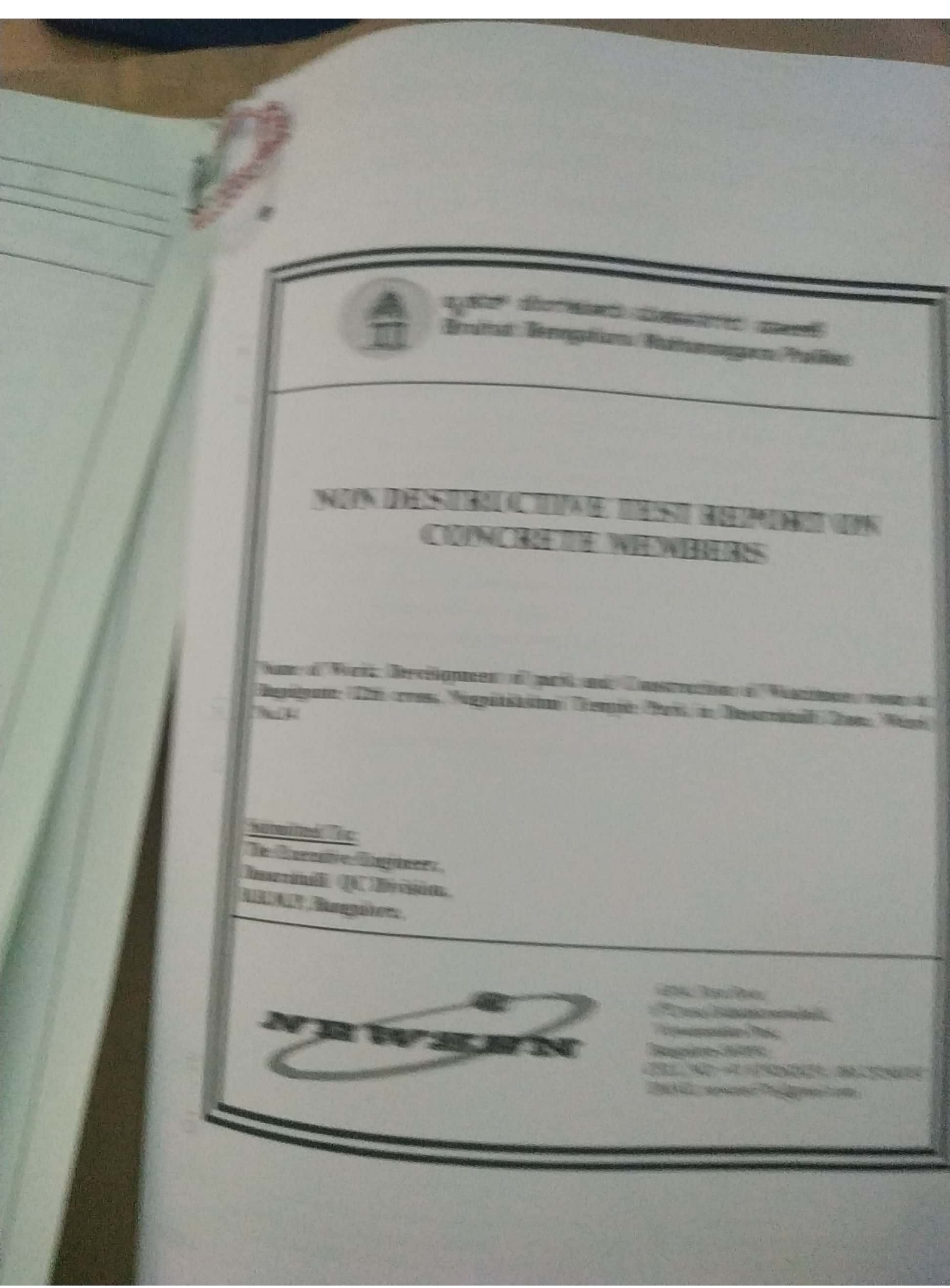

NON DESTRUCTIVE TEST REPORT ON
CONCRETE MEMBERS

NEWSUN

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A REPORT ON

Development of park and Construction of Watchmen room at Bagalgunte 12th cross, Nagalakshmi Temple Park in Dasarahalli Zone. Ward No.14

1. SCOPE OF WORK

Following is the scope of work on Non-Destructive Test (NDT) on the selected structural members of above said building Conducting Rebound Hammer Number (RHN) Test to assess the condition of concrete (to a depth of 25 to 50mm from the surface test) on different structural members of the above said structure

2. METHODOLOGIES AND INVESTIGATION

The in-situ testing systems for hardened concrete can be divided in two types

- Non-Destructive Testing (NDT)

Only non-destructive testing was conducted in the field.

3. EXPERIMENTAL RESULTS AND DISCUSSIONS.

4.1 Surface Hardness test using Rebound Hammer

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4.1. REBOUND HAMMER TEST

Rebound Hammer Number (RHN) Test is used to determine surface Hardness using Rebound Hammer. The equipment was developed by Ernst Schmidt in Switzerland in the 1940's and became commonly the rebound hammer is still known as the Schmidt hammer. The distance by which the mass rebounds in the hammer is a measure of the hardness of the surface.

To carry out the test, the plunger is pressed against the grid points on the surface concrete under test. This action releases the spring-loaded weight from its locked position thus the covering an impact while the hammer is still in its position, the sliding index is read to the nearest whole number. Before taking out the hammer from the grid point, lock the hammer by pressing the button provided. In the locked position, the rider will not move and the readings can be taken easily.

The reading is designated as the Rebound Hammer Number (RHN). The test can be conducted horizontally, vertically, upward or downward or at any angle. Here in this investigation the test conducted horizontally for both columns and beams.

The rebound hammer test results are influenced by several factors such as type of cement and aggregates, unevenness in surface, absorption of moisture content, age of concrete and extent of carbonation settlement in the concrete. The procedure adopted as per IS516 PART 5/SECTION 4.

The following are the guidelines for the qualitative assessment of RHN measurements

	Hardness of Concrete	
	Average RHN	Quality concrete
Rebound hammer readings	>40	Very good
	30 to40	Good
	20 to30	Fair
	<20	Poor
	0	Delaminated

5. OBSERVATIONS

From rebound hammer test the compressive strength of structural elements is presented in Table 1

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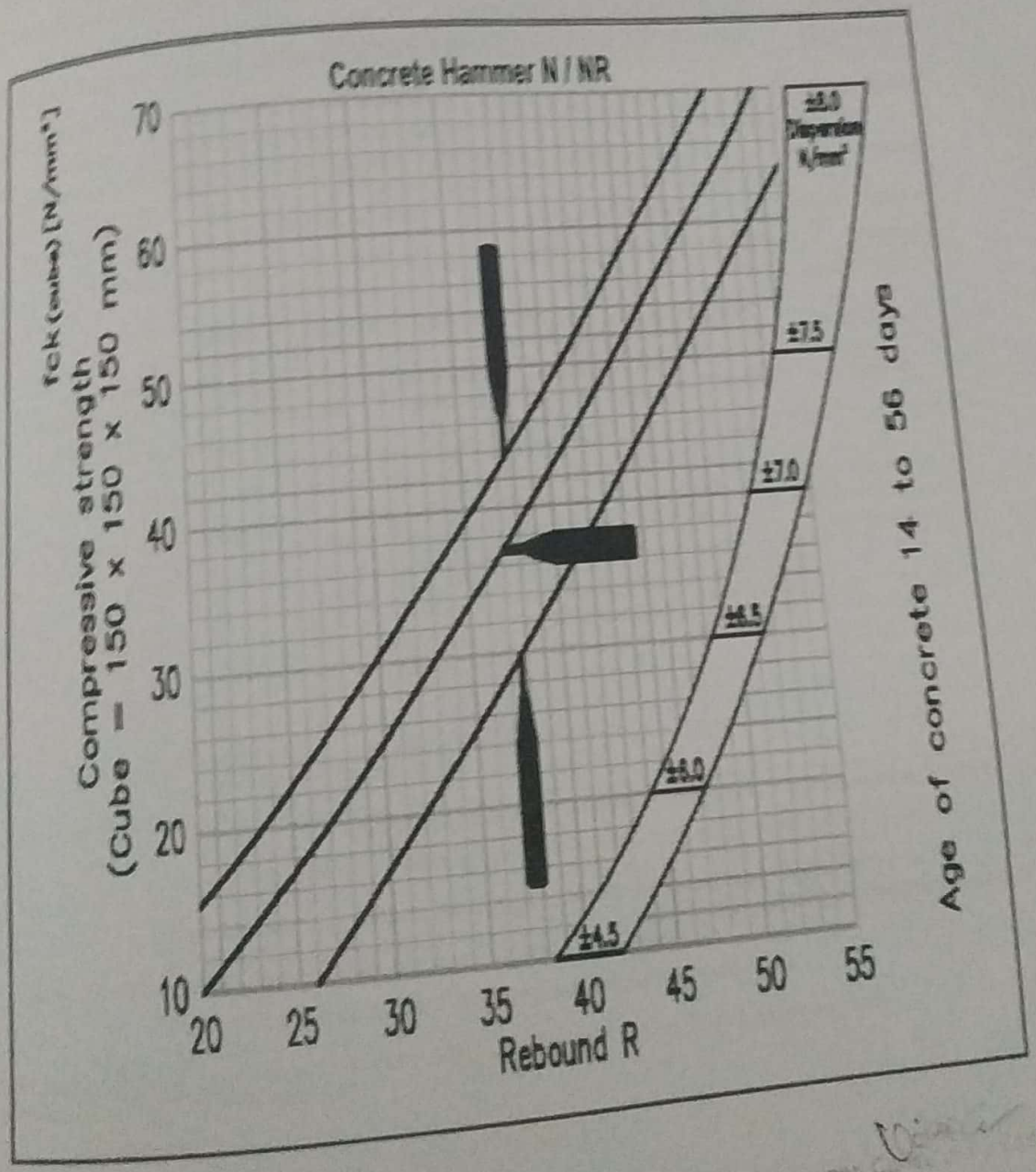

Proprietor

Gidadakonenahalli, Viswaneedam Post,
...gen576@gmail.com

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TEST REPORT OF REBOUND HAMMER

W.O No: BBMP/EE/DZ/PD/W.O/01/2022-23, Date:10/05/2022
Name of Work: Development of park and Construction of Watchmen room at Begalgunte 12th cross, Nagalakshmi Temple Park in Dasarahalli Zone. Ward No.14

Client : Executive Engineer Dasarahalli Division
Contractor : Sri. D.Anand Naidu , Banglore
Consultants : M/s NEWZEN CONSULTANT BANGALORE

Purpose	Kerb Stone	Date of Sampling	24-01-2023
Source	Gym Platform	Sampled by	QC AEE with PMC
Grade	M-15	Date of Testing	24-01-2023
Location	Kirloskar Layout Park Part-2	Tested by	PMC

Non Destructive Test (NDT) Results By Rebound Hammer

Sl.No.	Location	Direction of Hammer Used	Rebound Reading	Avarage Reading	Compressive Strength (N/mm²) for 28 days
1	Kirloskar Layout Park [Part-2]	Horizontal Direction (HD)	26	26.7	18.00
2			28		
3			26		
4			26		
5			28		
6			26		

Note: The Permissible Compressive Strength 15 N/mm² for 28 days

- The Results obtained are satisfactory as per standard requirements.
- The probable accuracy of prediction of concrete strength in a structure by the Rebound Hammer is ± 25%

For Newzen Consultants Bangalore
Proprietor

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NEW TECHNOLOGIES TO INNOVATE

TEST REPORT OF REBOUND HAMMER

W.O No: BBMP/EE/DZ/PD/W.O/01/2022-, Date:10/05/2022

Name of Work: Development of parks at Manjunathanagara Ramaiah layout and Soap factory Layout in Dasarahalli Zone ward No.14)

Client : Executive Engineer Dasarahalli Division

Contractor : Sri. D.Anand Naidu , Banglore

Consultants : M/s NEWZEN CONSULTANT BANGALORE

Purpose	Kerb Stone	Date of Sampling	24-01-2023
Source	Gym Platform	Sampled by	QC AEE with PMC
Grade	M-15	Date of Testing	24-01-2023
Location	Bhagalagunte Lake Park	Tested by	PMC

Non Destructive Test (NDT) Results By Rebound Hammer

Sl.No.	Location	Direction of Hammer Used	Rebound Reading	Avarage Reading	Compressive Strength (N/mm²) for 28 days
1	Bhagalagunte Lake Park	Horizontal Direction (HD)	24	23.66	16.00
2			26		
3			22		
4			24		
5			22		
6			24		

Note: The Permissible Compressive Strength 15 N/mm² for 28 days

- The Results obtained are satisfactory as per standard requirements.
- The probable accuracy of prediction of concrete strength in a structure by the Rebound Hammer is ± 25%

For Newzen Consultants Bangalore

Director

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NEWZEN CONSULTANTS BANGALORE

NEW TECHNOLOGIES TO INNOVATE

TEST REPORT OF REBOUND HAMMER

W.O No: BBMP/EE/DZ/PD/W.O/01/2022-, Date:10/05/2022

Name of Work: Development of parks at Manjunathanagara Ramaiah layout and Soap factory Layout in Dasarahalli Zone ward No.14)

Client : Executive Engineer Dasarahalli Division
Contractor : Sri. D.Anand Naidu , Banglore
Consultants : M/s NEWZEN CONSULTANT BANGALORE

Purpose	**Kerb Stone**	**Date of Sampling**	**24-01-2023**
Source	Gym Platform	**Sampled by**	**QC AEE with PMC**
Grade	**M-15**	**Date of Testing**	**24-01-2023**
Location	MEI Layout Park Part-3	**Tested by**	**PMC**

Non Destructive Test (NDT) Results By Rebound Hammer

Sl.No.	Location	Direction of Hammer Used	Rebound Reading	Avarage Reading	Compressive Strength (N/mm²) for 28 days
1	MEI Layout Park [Part-3]	Horizontal Direction (HD)	22	23.33	16.00
2			22		
3			24		
4			24		
5			22		
6			26		

Note: The Permissible Compressive Strength 15 N/mm² for 28 days

- The Results obtained are satisfactory as per standard requirements.
- The probable accuracy of prediction of concrete strength in a structure by the Rebound Hammer is ±25%

For Newzen Consultants Bangalore

Proprietor

NEWZEN CONSULTANT BANGALORE, #304, First floor, 6th cross,Gidadakonenahalli, Viswaneedam Post, Bangalore-560091. CELL NO: +91 8792620231, 080 23240187 EMAIL:newzen576@gmail.com

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QUALITY ASSURANCE REPORT/QUALITY CONTROL REPORT

EE/QA/PR/ 11 /2022-23, DATE: 15.02.23

Name of Work	:	Development of park and Construction of Watchmen room at Bagalgunte 12th cross, Nagalakshmi Temple Park in Dasarahalli Zone. Ward No.14 (Estimated cost – 150.00 Lakhs)
Job Code	:	014-20-000095
Bill No.	:	**1st & Final Bill**
Type of Test Performed	:	Rebound Hammer test As per IS13311-(2)-1992
Materials on which Tests Was Performed	:	1. Kerb stone (M15 grade)
Officers present during inspection	:	1. Sri. Venkateshappa AE – Ward no 14 2. Sri. Jayaraju.K.S. AEE-Quality Assurance
Project Management Consultants	:	**M/s NEWZEN CONSULTANT BANGALORE**
Observations	:	➢ NDT (Rebound hammer test) was conducted in presence of AE (Ward no 14) along with Project Management Consultants representative. ➢ The Rebound Hammer Test was conducted randomly on Kerb (M15) are recorded by the PMC consultants. ➢ The readings of Rebound Hammer Test are tabulated and analysis of test results done by PMC is here by furnished. ➢ During visual inspection it was intimated by Engineer in charge of work & PMC that items pertaining to gym equipment's & children play equipments in this bill have been executed. ➢ However certificate of warranty & test certificate obtained from the manufacture related to gym equipments & children play equipments. ➢ Neither request for inspection was raised nor file was submitted to QA office during the execution of the work. Therefore QA Division could not inspect the work during progress of work. ➢ This respective bill includes item of **Granite stone** for which test report obtained from Bangalore University for dry density, water absorption, specific gravity, moisture content, tensile strength and Moh's hardness. ➢ The location wise test results are reproduced in the tables shown below.
Test Locations	:	1. Location 1: Kirloskar Layot park 2. Location 2: Bagalgunte Lake Park 3. Location3: MEI Layout Park

15-2-2023

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಮಟ್ಟ ನಿಯಂತ್ರಣ ಉಪ-ವಿಭಾಗ ದಾಸರಹಳ್ಳಿ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

15/2/2023

ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಮಟ್ಟ ನಿಯಂತ್ರಣ ವಿಭಾಗ ದಾಸರಹಳ್ಳಿ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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Table-01: Rebound Hammer Test Results for Location-1

Sl. No.	Member	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2) for 28 days	Impact Direction
Sample Tested Location at Kirloskar Layout park					
1	Kerb Stone (M15)	26	26.67	18.00	Horizontal
2		28			
3		26			
4		26			
5		28			
6		26			

Table-02: Rebound Hammer Test Results for Location-2

Sl. No.	Member	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2) for 28 days	Impact Direction
Sample Tested Location at Bugalgunte Lake Park					
1	Kerb Stone (M15)	24	23.66	16.00	Horizontal
2		26			
3		22			
4		24			
5		22			
6		24			

Table-03: Rebound Hammer Test Results for Location-3

Sl. No.	Member	Rebound Hammer Number	Average reading	Compressive Strength (N/mm2) for 28 days	Impact Direction
Sample Tested Location at MEI Layout Park					
1	Kerb Stone (M15)	22	23.33	16.00	Horizontal
2		22			
3		24			
4		24			
5		22			
6		26			

Test Report for Granite stone Sample

SI NO	Test conducted	Test results	Requirments as per IS:14223,Part-1:1995, Table.1	Reference
1	Dry Density	2.635 g/cc	2.60-2.68	-
2	Water Absorption	0.38%	0.50, max	IS:14223(part1):1995
3	Specific Gravity	2.75	2.75, min	IS9143-1979
4	Moisture Content	0.05%	0.15,max	IS 13030-1991
5	Tensile Strength	141.0 Kg/cm^2	90.0 Kg/cm^2,min	IS 13365(part1)-1998
6	Moh's Hardness	6.5 on a scale of 10	6-7	-

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The file containing **1st & Final Bill** has been submitted for the above work to QA department on 12.01.2023 ...ing for spot inspection. Engineers of QA/QC division have visited the work spot on 24.01.2023.

During the inspection, it was understood that the items found in the bill, have been executed by the contractor ...e documents provided by PMC team and from the file submitted.

PMC team was instructed to assess the strength of concrete used for Kerb stone (M15) by Rebound Hammer ... the Rebound hammer test were conducted by PMC in presence of engineer in charge of work.

From the test results furnished by PMC consultants, it is concluded that the results of the samples collected are ...ordance with the standards/ specifications mention in the IRC codes. However, the results submitted by the PMC ...e been reproduced here with for further needful action. The results checked by QA/QC relates only for item tested in ...ticular location randomly.

Further, QA/QC directs the PMC and Engineer in-charge of the work that all materials used for the work shall ...spected, tested and accepted as per the relevant specifications before incorporation in the work. The frequencies and ...thods of sampling and testing materials, including those required for definite purpose and not covered by MORT&H ...ecifications shall be in accordance to the relevant IRC or BIS or AASHTO/ASTM/BS standards in order of priority

This respective bill also includes installation of gym equipments & children play equipments at various ...ations. As request for inspection was not made during the execution of these items of work, QA division could not ...spect during progress of work. However, randomly gym equipments & children play equipments were visually ...spected.

It was also instructed to engineer in charge of work to take necessary action to get it certified from competent ...uthority regarding items pertaining to gym equipments & children play equipments certified as per specification.

The concerned Engineer in charge of the work shall follow the direction issued by Chief Commissioner Letter ...umber dated 01.08.2022 and 14.09.2022 and take necessary action as appropriate in accordance with the law.

Note: -

This report by QA/QC is pertaining to the work carried out in **1st & Final Bill** only.

Engineer in charge of work shall display details of work, work code, cost of project, start and completion date, ...nd information of Engineer in charge of work with contact numbers at work spot.

Engineer in charge of work and Agency shall ensure that if any damages or defects occur pertaining to the ...ecuted work within the Defect Liability period (DLP), The same shall be rectified immediately on top priority without ...ail.

ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಗುಣಭರವಸೆ/ಗುಣನಿಯಂತ್ರಣ ವಿಭಾಗ ದಾಸರಹಳ್ಳಿ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ

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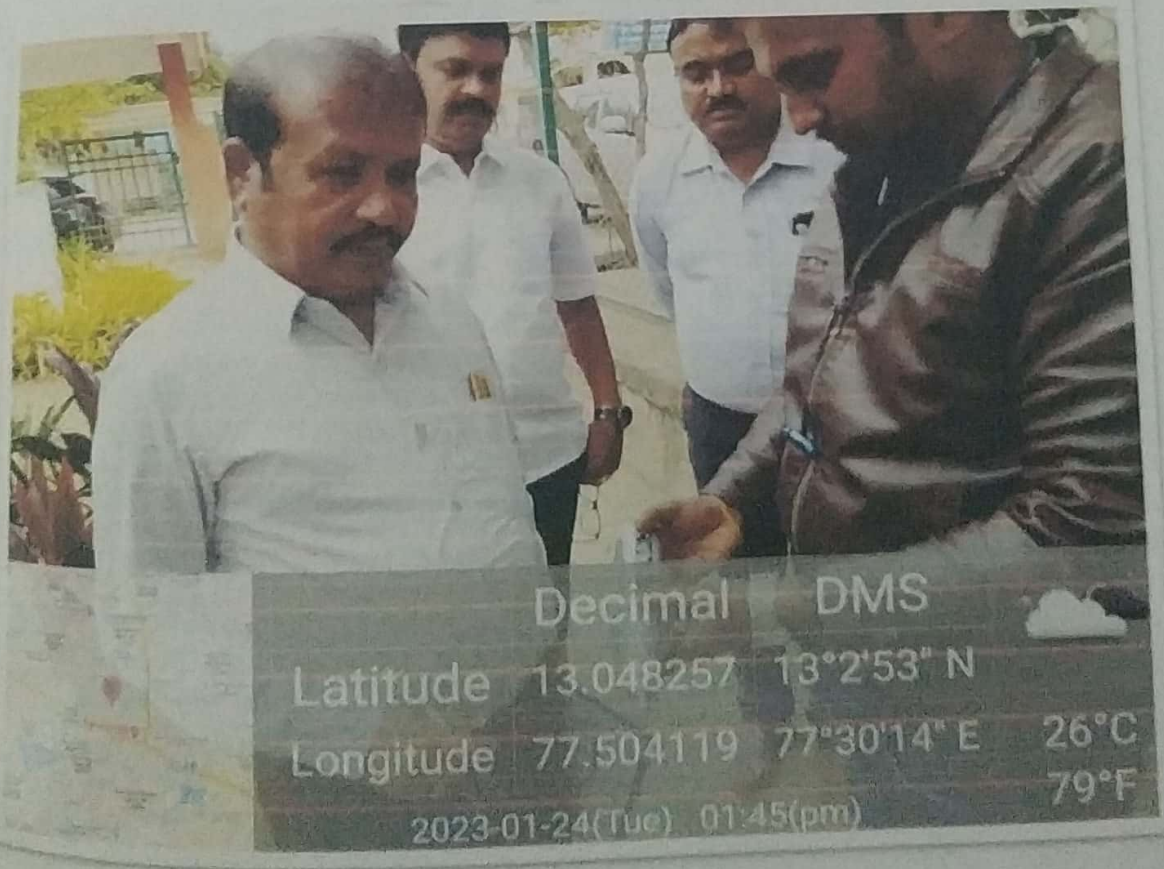
Location 1: Kirloskar Layot park



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Location 2: Bugalgunte Lake Park

Location 3: MEI Layout Park

15-2-2023

Engineer

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